

What is claimed is:

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CLAIMS

- 1 1. A switch for a computer network, the switch receiving ATM cells from the com-
2 puter network, comprising:
3
4 a switching fabric receiving a cell at an input port, said switching fabric selecting
5 a route there-through for said cell to an output port;
6
7 at least one queue within said switching fabric, said queue having an associated
8 threshold, said switching fabric determining the number of cells present in said queue,
9 said switching fabric determining if the next arriving cell for said at least one queue fills
10 said queue above said threshold, and in the event that said at least one queue is filled
11 above said threshold, then writing a flag bit within said cell to a "set" state;
12
13 a traffic manager to compute a ratio of cells having said flag bit set to a total
14 number of cells received at an output port, and in response to a value of said ratio either
15 discarding said cell or forwarding said cell onto an output link of said computer network,
16 said discarding step selecting a cell to be discarded on a random basis.
- 1 2. The switch of claim 1 further comprising:
2 an ASIC chip having said traffic manager implemented therein.
- 1 3. The switch of claim 1 wherein said flag bit further comprises: an EFCI bit of said
2 ATM cell.
- 1 4. The switch of claim 1 further comprising:
2 a switch fabric card, said switch fabric card having switching fabric chips and said
3 traffic manager mounted thereon.
- 1 5. The switch of claim 1 further comprising:

2 an IP linecard, said IP linecard receiving TCP/IP computer packets from a com-
3 puter network and forwarding ATM cells to said switching fabric.

1 6. The switch of claim 1' further comprising:

2 an IP linecard, said IP linecard receiving ATM cells from said switching fabric
3 and forwarding TCP/IP computer packets onto a computer network.

1 7. A switch for a computer network, the switch receiving IP packets from the computer
2 network, comprising:

3
4 a line card to convert said IP packets to fixed length segments;

5
6 a switching fabric receiving said fixed length segments from said line card at an
7 input port, said switching fabric selecting a route there-through for said fixed length seg-
8 ment to an output port;

9
10 at least one queue within said switching fabric, said queue having an associated
11 threshold, said switching fabric determining the number of fixed length segments present
12 in said queue, said switching fabric determining if the next arriving fixed length segment
13 for said at least one queue fills said queue above said threshold, and in the event that said
14 at least one queue is filled above said threshold, then writing a flag bit within said fixed
15 length segment to a "set" state;

16
17 a traffic manager to compute a ratio of fixed length segments having said flag bit
18 set to a total number of fixed length segments received at an output port, and in response
19 to a value of said ratio either discarding said fixed length segment or forwarding said
20 fixed length segment onto an output link of said computer network, said discarding step
21 selecting a fixed length segment to be discarded on a random basis.

1 8. The switch as in claim 8 further comprising:

2 said fixed length segment is an ATM cell and said flag bit is an EFCI bit of said
3 ATM cell.

1 9. A switch for a computer network, the switch receiving data cells from the computer
2 network, comprising:

3
4 a switching fabric receiving a cell at an input port, said switching fabric selecting
5 a route there-through for said cell to an output port;

6
7 at least one queue within said switching fabric, said queue having an associated
8 threshold, said switching fabric determining the number of cells present in said queue,
9 said switching fabric determining if the next arriving cell for said at least one queue fills
10 said queue above said threshold, and in the event that said at least one queue is filled
11 above said threshold, then writing a flag bit within said cell to a "set" state;

12
13 means for computing a ratio of cells having said flag bit set to a total number of
14 cells received at an output port, and in response to a value of said ratio either discarding
15 said cell or forwarding said cell onto an output link of said computer network, said dis-
16 carding step selecting a cell to be discarded on a random basis.

1 10. The apparatus as in claim 1 wherein said data cells further comprise ATM cells.

1 11. The apparatus as in claim 1 wherein said data cells further comprise fixed length data
2 cells.

1 12. The apparatus as in claim 1 wherein said data cells further comprise IP cells.

1 13. A method of operating a network switch, said network switch receiving fixed length
2 segments from a computer network, comprising:
3

receiving a fixed length segment at an input port of a switching fabric, said switching fabric selecting a route through said switching fabric from an input port to an output port of said switching fabric for said fixed length segment;

maintaining at least one queue of fixed length segments within said switching fabric, said queue having an associated threshold,

determining the number of fixed length segments present in said queue, and determining if the next arriving fixed length segment for said at least one queue fills said queue above said threshold, and in the event that said at least one queue is filled above said threshold, then writing a flag bit within said fixed length segment to a "set" state;

computing a ratio of fixed length segments having said flag bit set to a total number of fixed length segments received at an output port, and in response to a value of said ratio either discarding said fixed length segment or forwarding said fixed length segment onto an output link of said computer network, said discarding step selecting a fixed length segment to be discarded on a random basis.

14. The method of claim 13 further comprising:

using as said fixed length segment an ATM cell, and using as said flag bit an EFCI bit of said ATM cell.

15. The method of claim 13 further comprising:

using a Random Early Detection (RED) computational method to select said fixed length segment to be discarded on a random basis.

16. A method of operating a network switch, said network switch receiving TCP/IP computer packets from a computer network, comprising:

4 converting said TCP/IP packets to fixed length packets, said switching fabric se-
5 lecting a route through said switching fabric from an input port to an output port of said
6 switching fabric for said fixed length segment;

7
8 maintaining at least one queue of fixed length segments within said switching fab-
9 ric, said queue having an associated threshold,

10
11 determining the number of fixed length segments present in said queue, and de-
12 termining if the next arriving fixed length segment for said at least one queue fills said
13 queue above said threshold, and in the event that said at least one queue is filled above
14 said threshold, then writing a flag bit within said fixed length segment to a "set" state;

15
16 computing a ratio of fixed length segments having said flag bit set to a total num-
17 ber of fixed length segments received at an output port, and in response to a value of said
18 ratio either discarding said fixed length segment or forwarding said fixed length segment
19 onto an output link of said computer network, said discarding step selecting a fixed
20 length segment to be discarded on a random basis.

1 17. The method of claim 16 further comprising:

2 using as said fixed length segment an ATM cell, and using as said flag bit an
3 EFCI bit of said ATM cell.

1 18. The method of claim 16 further comprising:

2 using a Random Early Detection (RED) computational method to select said fixed
3 length segment to be discarded on a random basis.

1 19. A computer readable media containing instructions for practice of the method of
2 claim 13.

1 20. Electromagnetic signals propagating on a computer network, said electromagnetic
2 signals carrying information for the practice of the method of claim 13.